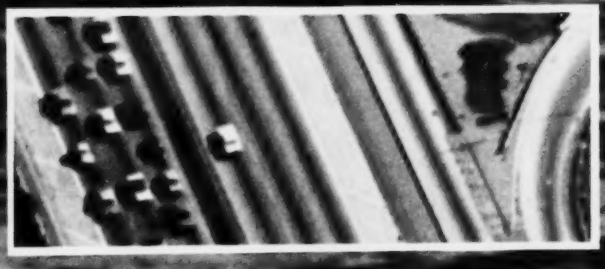
NOVEMBER
1976

DRIVER

HAWAIIAN
ODYSSEY

WIDE WORLD OF WHEELS

48-STATE
YOU-HAUL



BIRD'S-EYE VIEW
OF L.A. TRAFFIC

DRIVER

y'all wanta YOU-Haul?

Adequate planning and preparation are the keys to a successful do-it-yourself move. Going over literature from U-Haul, Ryder, and their military household goods office in the comfort of their living room, this couple plans to save time, trouble, and money when moving day arrives.

If there's one thing military members do more of than any other single group of people, it's move—from base to base, station to station, port to port, and finally to a terminal residence. Some servicemen and women let commercial van companies move their household goods; others do it themselves. Either way, it's usually a hassle.

Uncle Sam has always paid for officially authorized moves, whether you called in the "experts" to do it for you or rented a truck or trailer and did it yourself. The only limitation has been on the weight allowance according to your rank or grade. If you moved yourself, you made your own arrangements, did your own financing, kept receipts, and were reimbursed for the actual cost to you or a sum not in excess of what a commercial mover

Earning incentive pay is the name of the game

would have charged, whichever was less. If you saved Uncle Sam some long green, he pocketed it.

Comes the revolution! Last June 1, Congress directed the Department of Defense to share its savings with do-it-yourself movers. Service members may now keep the difference between their actual costs for renting a truck or trailer and related expenses and 75% of what it would have cost the government to move them commercially.

The Do-It-Yourself Program (DIYP), as it's officially called, was pioneered by the Navy in 1971, picked up by the Army and Marine Corps in 1975, and adopted by the Air Force in March 1976. The Coast Guard, not a part of DOD or this program, utilizes commercial carriers almost entirely to move its members. It is now, however, exploring the possibility of adopting DIYP.

Moving your household goods is BIG business. Except in 1968, DOD has annually spent considerably more money to move personal property than it has to move tanks, bombs, bullets, trucks, and similar equipment and supplies. In Fiscal Year 1975 alone, $800 million went for personal property moves—enough to completely fund three Army infantry divisions for a year.

Tacked on to this figure were another $40 million-plus for claims paid to more than 100,000 service members for personal property stolen, lost, or damaged during commercial shipments. During the first three months of the new DIY program, however, the Air Force didn't have a single such claim from

continued

DRIVER

THE TRAFFIC SAFETY MAGAZINE FOR THE MILITARY DRIVER

NOVEMBER 1976

VOLUME 10 NUMBER 6

CONTENTS

FEATURES PAGE

Y'all Wanta You-Haul? 1
More '77 Cars 8
Hawaiian Odyssey 12
Winging It 16
Emergency! ..... Back Cover

DEPARTMENTS

Double Clutch 2
The Backyard Mechanic 22
Backfire 28
Tuneup 29

DEPARTMENT OF THE AIR FORCE ■ HQ AIR FORCE INSPECTION AND SAFETY CENTER
Norton Air Force Base, California 92409

Lt Gen JOHN P. FLYNN
The Inspector General, USAF

PUBLISHED IN COOPERATION WITH THE DEPARTMENT OF THE ARMY AND THE DEPARTMENT OF THE NAVY

Dr. FRANCIS S. McGLADE, Director of Safety, United States Army
Maj Gen RICHARD E. MERKLING, Director, Aerospace Safety USAF
RADM WM. ELLIS, Commander, Naval Safety Center

Col DAVID E. RALEY, Chief, Safety Education Division
VIRGINIA HENDRIX, Editor

SSgt DON HOLT, Technical Editor
FRANCIS R. (FRAN) FOWLER, Feature Editor
DON KELLEHER, Art Director
MSgt BILL FOSTER, Staff Artist
MSgt MIKE KEEFE, Staff Photographer
ALICE MILKEY, Editorial Administration

AFRP 127-1

SUBSCRIPTION—DRIVER is available on subscription for $8.65 per year domestic; $2.20 additional for foreign mailing, 75c per copy, through the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402. Changes in subscription mailings should be sent to the above address. Single copies will be sold and back copies will be furnished when available. Use of funds for printing this publication has been approved by Headquarters, United States Air Force, Department of Defense, Washington, D.C. No payment can be made for manuscripts submitted for publication. Contributions are welcomed, as are comments and criticism. Address all correspondence to the Editor, DRIVER Magazine, AFISC/SEDD, Norton AFB, CA 92409.

ATTENTION DEPT OF THE NAVY PERSONNEL: Address all queries concerning distribution to NAVSAFECEN, NAS, NORFOLK, VA 23511, Attn: Safety Publications Dept. All other correspondence will be welcomed by the Editor.

The contents of this magazine are informative and should not be construed as regulations, technical orders, or directives unless stated. Address reprint requests, stating intended use of material, to the Editor. The Editor reserves the right to make any editorial changes in manuscripts which he believes will improve the material without altering the intended meaning.

Certain individuals shown in this magazine are not members of the Air Force and therefore do not conform to Air Force grooming standards.

THE EDITOR SPEAKS

DOUBLE CLUTCH

$ AND ¢

Do you know what it *really* costs you to own and operate your car? It's probably a lot more than you think.

The federal government has been studying this question at intervals over the last 25 years and has just published the latest answers. Their findings for 1976:

Standard car (4,000 lbs) . . . 17.9¢ mile
Compact (2,700 to 3,600 lbs) 14.6¢ mile
Subcompact (less than 2,700 lbs) . . . . . 12.6¢ mile

If you're driving a new, standard size automobile, these figures mean it can cost you $200 a month over and above your car payments! No wonder a lot of us run out of money before we run out of the month. Of course, not all costs are cash outlays. Depreciation doesn't catch you 'til you get rid of the car.

These figures are for the average driver. That means you buy the car in Baltimore, Md. (they had to pick someplace), keep it 10 years and drive it 100,000 miles, putting 14,500 miles on it the first year. Ownership costs—such things as depreciation, insurance, license fees—are surprisingly high. Here's how costs break out on the standard car:

Depreciation . . . . . 4.9¢
Maintenance . . . . . 4.2¢
Gas and oil . . . . . 3.3¢
Parking, tolls . . . . . 2.2¢
Insurance . . . . . 1.7¢
State and federal taxes . . . . . 1.6¢

Smaller cars naturally cost somewhat less. If you're interested in knowing more about these costs, write the Highway Statistics Division, Department of Transportation, 400 7th St., S.W., Washington, DC 20590. Ask for "Cost of Owning and Operating an Automobile 1976." It's free.

NEXT MONTH:
"Gas Up 'n' Go?"

some 3,500 servicemen and women who filed for incentive checks. It's easy to understand then why Uncle wants to share the wealth.

MONEY SAVING PROGRAM

DOD is anticipating that do-it-yourself moves will increase from about 2% of all moves in the past to 20% or 30% in the future.

Who is eligible? Anyone planning a permanent or temporary change of station (PCS or TDY), retirement, separation, or assignment to or termination of an assignment to government quarters. DIYP is strictly voluntary. You can choose it or a government bill of lading (GBL) move or a combination of both. And you are free to self-haul your total weight allowance.

When is DIYP especially advantageous? Proponents say it's good when: you want to use some of your possessions en route; you have a residence waiting to move into at your destination; you don't want to wait for your possessions to arrive by GBL at the other end; or you're PCSing or leaving the service and you have only a few hundred to 1,500 pounds of property and just don't want to hassle with movers.

In all fairness to commercial van lines, we point out that DIYP involves a lot of personal labor for packing, loading, driving, unloading, unpacking, and placement of furniture. It can result in self-damaged goods, fatigue, muscle aches and strains, possible accidents, family arguments, and the red tape of claiming and waiting for your incentive pay.

Although you normally don't have to advance any funds other than for possible emergencies en route, it usually takes from 45 to 60 days after your move to have your DIYP claim processed and for the finance office to send a check for any incentive pay earned.

DIYP is not for everyone. The program is good only in the 48 contiguous United States. If you are being transferred out of these states for an unaccompanied tour of duty, however, you can still self-move your household goods to any one of the 48 before departing.

NAVY IS DOD'S OPR

Navy manages the overall DIYP contract for DOD, but each branch of the military service runs its own program. If you're in the Army, contact your Installation Transportation Office (ITO); if Navy or Marine Corps, your Household Effects Office (HEO); if Air Force, your Traffic Management Office (TMO).

Only two companies have a government contract to rent equipment to you—U-Haul International and Ryder Truck Rentals, Inc. U-Haul which has more than 14,000 dealers across the nation, rents both trucks and trailers, while Ryder's 2,200 dealers specialize in trucks. But the choice may not be yours.

Before wasting your time running around getting rental estimates, contact your ITO, HEO, or TMO, and a moving counselor will explain the options available to you. If you're in the Air Force, there's a brand new 35mm taped slide program on DIYP scheduled to reach the field this month for your TMO to show you.

The counselor will talk over your space and distance requirements (how much and how far, moving aids, packing materials, etc.); will call either or both the locally designated U-Haul or Ryder dealer for a firm bid on equipment rental costs (depending on total amount); and will then compare this figure with the cost of a GBL move.

If U-Haul's or Ryder's figure is less than 75% of the constructive GBL cost (based on actual or authorized weight, whichever is less), your moving

continued

Easiest, quickest way to connect cargo trailer lights to the light wires in your car's trunk is with this 50-cent, four-wire kit of metal clamps and plastic sheaths. Simply clamp white wires to white plugs for tail lights, black wires to black plugs for stop and signal lights. It's as easy as 1, 2, 3, 4.

Because tail light wiring in station wagons and pickup trucks is normally inaccessible for hooking up trailer lights, a special kit permits you to bypass the hidden wires. Costs about $3.80. Just remove the tow car's tail light lenses and bulbs, insert tap-a-lite bulbs, replace lenses with wires from the special bulbs left hanging outside, and insert male connectors of trailer wires into tap-a-lite connectors.

A vehicle-in-tow can be fully lighted at night with this easy-to-install set of Pemco towing lights. It has wires long enough to reach the rear of the vehicle-in-tow without binding during turns. Installs like a tap-a-light kit and costs about $6.65.

office will then authorize the lowest bidder to rent equipment to you. While Uncle Sam will pay for actual costs up to 100% of GBL, he will only give incentive pay on savings below 75% of GBL. The Internal Revenue Service then withholds 20% of your incentive check for income taxes.

Under their contracts, U-Haul and Ryder must furnish an appropriate size truck and/or trailer and packing materials within 72 hours of notification. For intercity moves with a truck, they must also give you a cash operating allowance to cover gas, oil, special permits, weight tickets, and toll fees en route. For local moves where you rent from and return equipment to the same dealer, fuel and oil are furnished—no cash outlay is provided.

DISTANCE, TIME LIMITATIONS

There is no time or mileage limit on local moves. Your time and distance allowances for intercity moves will be determined by your moving office based on an Official Table of Distances plus 15% or 50 miles, whichever is greater. A loaded weight ticket is required on all moves and may be obtained from a government or commercial scale.

In most instances, the number of days allowed to move under your rental contract will not correspond with the travel time allowed in your orders; any time used in excess of your official travel time will be charged as ordinary leave. And if you exceed either the maximum time or mileage limit in your rental contract, you will be required to pay the extra costs directly to the dealer to whom you turn in your rental vehicle.

Members with a 225-pound gross weight allowance may use DIYP, but they should contact their moving office for details. You may collect a travel allowance if it's a PCS or TDY move but no additional allowance if it's incident to discharge or separation from the service. You may also receive a travel allowance for your dependents in lieu of other transportation if they ride to your new destination in your rental truck or privately owned vehicle (POV). These payments are processed separately from DYIP, however.

RENTING, BUYING EQUIPMENT

You can choose from a large variety of truck and trailer sizes, depending on your weight allowance and the company selected. Two-axle trucks run from 12 to 24 feet in van size, most are equipped with easy-to-drive 4- or 5-speed syncromesh or automatic transmissions, most have radios, and all have loading ramps and relatively comfortable cabs. U-Haul also rents 4x6, 5x8, and 6x12-foot, enclosed trailers.

What else are you authorized to *rent*? You'll probably need furniture pads, a hand truck or dolly, and, if you rent a trailer, side-view mirrors (required by law) and a trailer hitch.

You can also use government money to *purchase* various types of packing cartons, wrapping paper, sealing tape, rope, padlock(s), and, for trailers, light connector kits and a hitch ball.

If a rental hitch won't fit your tow vehicle, you won't be authorized to rent a trailer unless you're willing to buy a permanent or bolt-on hitch in which case, since it's reuseable, you must pay for it. If you already have a permanent hitch on your vehicle, it can be adapted—at government expense—to accommodate a rental trailer.

You must also pay to rent a tow bar (about $15 to $36 depending on destination) for towing a vehicle behind a truck. This will, however, eliminate the need for two drivers and saves on fuel expenses. Other nonreimbursible items include a car-top carrier (rents for about $9 to $20) and a transmission cooler (a super idea if you want to protect the engine of your tow vehicle from over-heating and possible breakdowns).

Keep in mind that you don't have to rent any of the authorized extra items if you already have your own equipment, packing boxes and materials of adequate strength and quality, etc., or if you just don't need them.

Can you receive incentive pay if you use your own vehicle to haul your property? Yes, if you own a truck or trailer (4x6 feet or larger) designed to haul cargo. Any vehicle eligible under Joint Travel Regs to be shipped overseas (car, station wagon, pickup truck, camper, or econoline van) will not qualify for DIYP.

ACCIDENT AND CARGO INSURANCE

Under their contracts, U-Haul and Ryder provide accident insurance coverage for van type trucks of $1 million personal liability, $2 million group liability, and $50 thousand property damage on each contract. Vehicle coverage on trailers also is provided but no specific limits are set under the contract.

If you plan to tow a trailer behind your vehicle, check your own auto insurance policy first. Some insurance companies cover you for pulling a trailer; others do not. If you need extra insurance, you must purchase it yourself since this is not a reimbursable item. Another point: Some states don't consider operating vehicles on PCS or TDY moves to be within the scope of your military employment. In such states you may be held *personally* liable for all damages occurring in those states which result from your negligence and are in excess of contractor-furnished coverage.

Any accidents, losses, or damages should be reported as soon as possible either to U-Haul or Ryder as appropriate and to the claims officer and moving office at the military installation (regardless of service branch) nearest the point of accident or loss. An on-the-spot inspection is necessary for filing your claim.

BE PREPARED, GOOD BUDDY

Both U-Haul and Ryder are committed to giving you equipment in first-class running condition, and both will check you out thoroughly. Don't be afraid to admit you've never driven a truck or towed a trailer—insist on a check-drive and ask lots of questions. Once you've pulled away from the rental lot, you'll be on your own for hundreds or maybe thousands of miles. Both companies will provide you with some neat little booklets and instructions describing everything from how to plan and make your move to taking care of your rig along the way and what to do in case of a breakdown or accident.

Based on its many years of experience, U-Haul has identified the "four most important causes of accidents" in each of three rental equipment categories. Ranking No. 1 in each is "driver error." Following are the three other

continued

Towing your car behind a moving van during a do-it-yourself move has economic advantages. But don't louse them up by ignoring the instructions for correctly installing the tow bar and driving with it safely. And *DON'T* install your safety chains like this! They really don't help much unless hooked up to the tow car.

Correctly matching the ball hitch of your tow vehicle to a deadweight trailer hitch is critical. If yours is a permanent hitch, you'll need a hitch ball of 2 or 2⅛ inches in diameter for U-Haul trailers.

Uncle Sam will permit you to rent both a six-wheeled truck up to 24 feet in van size and a tandem wheeled, 6x12-foot enclosed trailer.

Ryder Systems specializes in renting trucks and believes that either a 12-, 18-, or 22-foot van will satisfy the average do-it-yourself mover's needs.

Do-it-yourselfers can select a 4x6, 5x8, or 6x12-foot enclosed U-Haul trailer for moving a small amount of goods across town or up to four rooms of furniture across country.

continued

Y'ALL WANTA YOU-HAUL?

"most important causes" by classification:

Truck Driving—failure to decrease speed, failure to allow sufficient stopping distance, and failure to watch for overhangs.

Trailer Towing—failure to load heavier in the front of the trailer, excessive speed, and failure to inspect equipment.

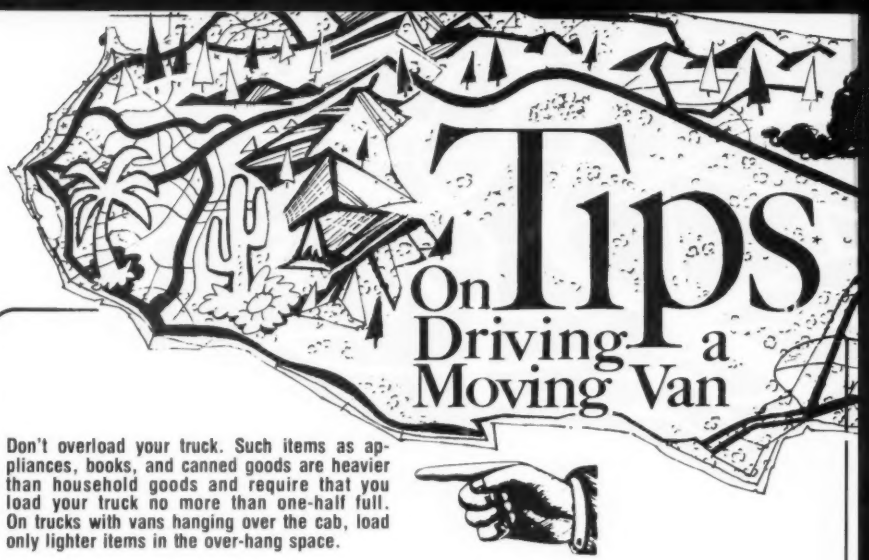
Towing Vehicles with a Tow Bar—failure to decrease speed, failure to inspect equipment, and improper assembly of the tow bar.

The principles of protecting your equipment and cargo and staying alive on the highway are generally the same and call only for good judgment and common sense. Listed in adjacent columns are some straight forward tips on truckin' and towin'. Anyone who drives a truck or tows a trailer, including recreation vehicles, should find them helpful.

So ten-four, good buddy. Have a safe, happy, and profitable move.

Both Ryder and U-Haul have trailer hitches and tow bars designed to fit almost any car, van, or pickup truck. This U-Haul dealer will rent you a temporary hitch or sell one for permanent installation.

Brand or company names and products mentioned or pictured do not represent endorsement by DRIVER or the U.S. Air Force.



Tips On Driving a Moving Van

Don't overload your truck. Such items as appliances, books, and canned goods are heavier than household goods and require that you load your truck no more than one-half full. On trucks with vans hanging over the cab, load only lighter items in the over-hang space.

In loading, load heaviest items first—up front and on the floor. Load lightest items last—near the roof and rear. Load evenly from side to side and pack all goods closely and firmly. Secure any partial loads with ropes. Keep the center of gravity low and between the front and rear wheels. Improper loading can affect a truck's road handling drastically and will not only set you up for an accident but will also cause driving fatigue.

Do not transport flammables such as gasoline or paint thinner. An empty or partially full container is just as dangerous as a full one.

Check on the laws in your state about carrying passengers in the back of a truck, including cargo econolines and pickups. Passengers in the rear risk injury due to shifting cargo, asphyxiation, and lack of collision protection.

Get acquainted with your truck. Familiarize yourself with the interior of the cockpit and layout of the controls. Is the seat adjusted to fit your frame? Can you see out the side view mirrors? With seat belt on, test the operation of the brakes, clutch, and gear shift before starting the motor.

Turn on lights at dusk. Dim lights when approaching or following other vehicles. Use "dims" in rain, snow, fog, smog, and dust. Never drive with parking lights only.

Before driving your truck, give it a walk-around check. Warm up the engine to normal operating temperature. Use the hand choke if necessary. Listen for any unusual engine noises—check 'em out now. Do some practice driving in a parking lot or on a little used street. Back it up a few times. Get used to your baby before you get on the road and into traffic.

Check engine oil and radiator levels every time you buy gas. If the radiator level cannot be visually checked on a coolant overflow system, wait until the engine is cool or do it in the morning before driving.

Remember a truck doesn't go as far on a full tank of gas as your car. Watch the gas gauge.

It's a good idea to "kick the tires" every time you gas up and before starting out in the morning, especially rear dual tires. Use a tire iron or ball bat just like the pros do. Buy yourself a tire pressure gauge (one for truck tires)—it's a good investment for any vehicle. Check pressures when tires are cold. Air pressures will be slightly higher than recommended for your particular truck if the tires are warm, but do not bleed off this excess pressure.

Once underway, control your speed. Maximum recommended speed is 45 mph—some rental trucks even come equipped with governors set at 50 mph. Speeds over 45 mph can also cost 25% more gas.

In going up hills, shift to lower gears so the motor turns over easily and doesn't lug or heat up. On downgrades, use lower gears and allow engine compression to hold down the speed. Vehicle stability decreases rapidly going downhill, so slow down and shift down before starting down.

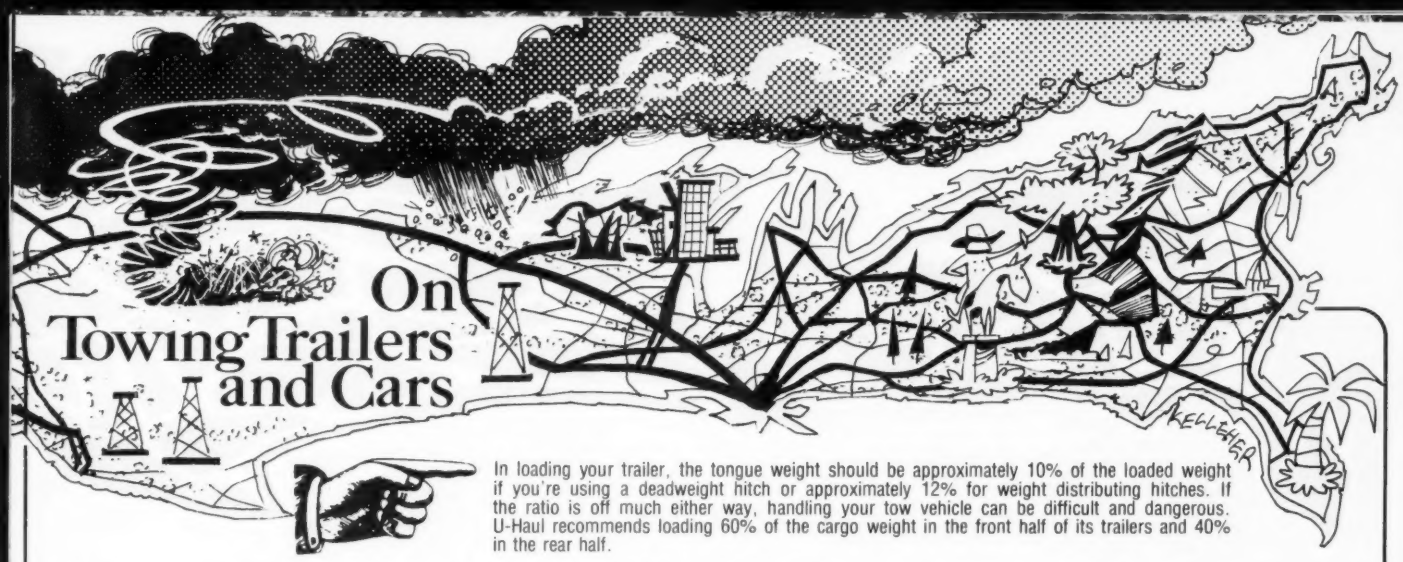
Stopping a truck can be a bear and requires more distance than a passenger car. Allow at least one truck length between yourself and the vehicle ahead for every 10 mph of speed.

Turning a truck obviously requires more room than a car. Slow down, make a wider turning arc, and take care to remain in your own lane.

Passing in a truck requires more time and distance than in a car, because a truck is heavier and longer. Allow plenty of clear highway ahead and never pass on hills or curves. Passing another vehicle can also create an air suction tending to move both vehicles sideways, so be alert—keep both hands on the steering wheel.

Beware of overhead obstacles—bridges, gas station and motel canopies, restaurant signs, overpasses, trees, toll booths, narrow alleys, enclosed parking lots. Most U-Haul trucks require 11 feet of clearance, while Ryder's trucks require 12 feet.

Parking requires practice. There is a blind spot immediately behind a truck. Reliance on rear view mirrors is not enough. Have another person stand behind the truck and guide you if possible. Always use the parking brake and put the transmission in gear (in "Park" if it's an automatic). When parking downhill, turn the front wheels toward the curb; uphill, away from the curb. Never rely on the parking brake alone.



On Towing Trailers and Cars

In loading your trailer, the tongue weight should be approximately 10% of the loaded weight if you're using a deadweight hitch or approximately 12% for weight distributing hitches. If the ratio is off much either way, handling your tow vehicle can be difficult and dangerous. U-Haul recommends loading 60% of the cargo weight in the front half of its trailers and 40% in the rear half.

If you use a deadweight hitch, all tires on your tow vehicle should be inflated "up to vehicle capacity" as shown in your vehicle owner's handbook. For a load-leveling hitch, inflate the front tires 2 pounds above normal pressure. Never exceed the "maximum pressure" indicated on the side of each tire.

Do not use an axle-mounted hitch. It can cause damage to the axle housing, wheel bearings, wheels, or tires.

Periodically check your trailer hitch to insure that all bolts and nuts are tight and the safety chain is secure.

If your car has an energy absorbing bumper system, use only a hitch which does not restrict its operation.

After removing a hitch, be sure to seal any mounting holes in the underbody of your car to prevent possible entry of exhaust fumes, dirt, or water.

More frequent vehicle maintenance is required for trailer towing. For most late model cars, you should change automatic transmission fluid and filter and the rear axle fluid every 15,000 miles; engine oil every 3,000 miles or three months, whichever occurs first; and the PCV valve every 12 months or 15,000 miles, whichever occurs first.

If you have a new car or an older car with a new engine, transmission, or axle, avoid towing a trailer during the first 500 miles break-in period. If necessary to tow during this period, avoid speeds over 50 mph and full throttle starts.

Before starting a trip, practice turning, stopping, and backing up in a traffic-free area. Learn to check your mirrors every time you start forward or move into traffic. Also get the "feel" of using the brakes on both your car and trailer (if it has automatic brakes).

Side-mounted mirrors on the cab or fenders are mandatory for trailer towing in most states. They should be adjusted every time you change drivers—it takes only a minute.

In turning, remember the trailer wheels will be closer to curbs and the inside of curves so drive slightly beyond your normal turning point. Signal all turns and avoid sudden maneuvers.

Allow ample distance for passing other vehicles and ample clearance before cutting back in front of a passed vehicle. Signal well in advance of each move.

Stopping with a loaded trailer may require more distance than usual. Allow at least one length of your car and trailer combined for each 10 mph on your speedometer between you and the vehicle ahead, more in bad weather.

For long uphill grades, avoid engine overheating by down-shifting the transmission and reduce your speed to 45 mph or less. On long or steep downgrades, slow down and gear down to aid in braking.

Never transport passengers or cargo in a vehicle-in-tow (illegal in most states). Besides interfering with free movement of the steering wheel, passengers run the risk of asphyxiation by exhaust gases from the tow vehicle.

Skillful backing with a trailer requires practice. Keep your right hand at the bottom of the steering wheel. To move trailer left, move your hand left; to back right, move your hand to the right. If at all possible, have a second person in your view through the mirror to guide you.

Parking a vehicle with a trailer on a grade is not recommended. If necessary, however, (1) apply regular brakes; (2) have someone place wheel chocks under trailer wheels; (3) when chocks are in place, release regular brakes until chocks absorb load; (4) apply parking brakes; (5) place transmission in "Park" position. Reverse above sequence when starting.

Do not apply brakes while turning; slow down to turning speed first. Do not turn a corner immediately after coming to a complete stop. Pull straight ahead a few feet, then turn while moving. Too sharp a turn will cause the tow bar to bind.

All U-Haul trailers are equipped with a four-wire harness for stop, turn, and running lights and (tandem trailers only) side marker lights. Unless your tow vehicle already has a built-in connecting receptacle, you'll need to purchase an inexpensive, reusable wiring kit to hook in to the light wires inside your car's trunk. Special connector kits also are available for towing another vehicle (parking lights alone are not enough for a vehicle-in-tow).

Regardless of whether you use a curved or straight tow bar, bumper or frame model, the tow vehicle must always be larger and heavier than the vehicle-in-tow. If your tow vehicle is light in the rear such as an unloaded van or pickup truck, you must decelerate slowly and avoid panic stops. Likewise, if your tow vehicle has a short wheel base or high center of gravity like a Bronco or Jeep, its handling characteristics are different from a passenger car and require a good dose of familiarity before starting a trip.

Do not tie down the steering wheel of your vehicle-in-tow or allow anyone to steer it. If it is equipped with a steering column lock, disconnect the battery and turn the lock so the steering wheel is free to move. The driveshaft should also be removed from the towed vehicle to avoid transmission damage.

Don't ever back up when towing another vehicle. A tow bar is designed for forward motion only. Choose parking spaces allowing you to exit by driving directly forward. If you get boxed-in and have to back up, disconnect the tow bar and back both vehicles separately.

Finally, if your vehicle combination seems unstable, do not increase speed because it will only get worse. Slow down gradually and stop completely off the highway. Check vehicle-in-tow tire pressure, steering wheel freedom, front end alignment, and tow bar connection. If necessary, have the nearest rental dealer exchange the tow bar or disconnect and drive the vehicles separately. DO NOT DRIVE with an unstable combination.

MORE '77 CARS

DRIVER checks out the new offerings from Ford, Chrysler, and American Motors (GM was covered in September issue)

With federal mileage minimums going into effect the next few years, Detroit declared that the only way the new minimums could be met was to "down'size" their offerings and use smaller, lighter engines and components. General Motors is the first corporation to make the step of down-sizing their full-size cars, while other makers are waiting and will introduce the smaller cars in '78.

Of course, all the major manufacturers have small cars as a part of their lineups, but the down-sizing effort as applied to the large cars will, we feel, bring us all benefits.

Not only will mileage increase with little or no decrease in useable load space, but lighter chassis, engine, and drive train components, coupled with an increase in braking efficiency, will result in a new breed of better handling full-size American cars.

continued

1

The popular and practical Ford Ranchero has new grille and paint treatment, stacked headlamps, and standard 302 V8. Californians get the 351 V8 as standard equipment.

2

One of the newest offerings from Ford is the Custom Cruising Van or Wagon. Both Econoline and Pinto have the colorful package that includes super paint, and portholes with black "privacy" glass. Although it sure looks neat, we can't say we know anything about it from a safety standpoint.

Dodge Aspen and Aspen R/T (shown here) '76, is little changed for '77. Car continues to offer loads of interior space in a fairly compact shell. Mileage is excellent and handling is as good as Chrysler's tradition demands.

4

If all cars handled the way the new Road Runner with optional "police" suspension does, we bet there would be fewer accidents. Car is nimble, stops well. Wide tires, "T-bar" roof, and 225-2 barrel Super Six could make it a winner in looks *and* economy.

1

2

3

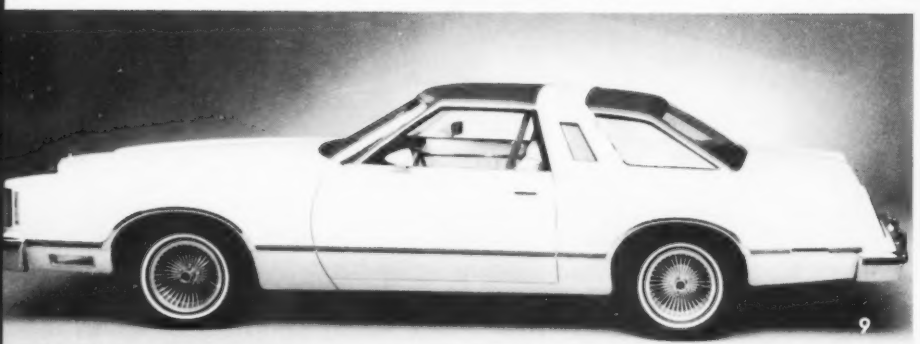
4

6

5

7

8



9

5

What can we say? Jeep is little-changed externally, offers CJ-7 long wheelbase model with hard top. Cherokee Chief, Wagoneer, Honcho satisfy need for larger four-wheel-drive vehicles. Note factory-installed roll-bar in picture above . . . we think it's a great idea!

6

Dodge trucks, long famous for stodgy styling, introduce the Warlock, a neat-looking, black, gold-striped, step-side pickup. Trick truck with six-cylinder engine is reputed to get best gas mileage of light pickups.

7

American Motors Hornet AMX has all the flares, spoilers, stripes, etc., that you'll ever need. Targa-style roof is new. Optional 304 V8 gives it punch plus acceptable mileage.

8

Gremlin X features restyled grille, more rear glass area, and four inches less length. Always an American mileage champ, Gremlin is generally credited as being the first American sub-compact.

9

Thunderbird is the only all-new car in the Ford line-up. The car is radically reduced in both size and price. New 114-inch wheelbase and 215.5-inch overall length is similar to older mid-size Torino. Standard equipment includes 302 V8, power front discs, and rear stabilizer bar.

10

11

12

13

continued

'77 CARS

10

The Mustang's Cobra II option for '77 has more colors, more decorative options. Performance levels are a hollow shell of the Cobras and GT350s of the past, but Cobra II's handling is much improved over standard Mustang II.

11

Ford Granada Sports Coupe option is a real safety leader with its optional four-wheel disc brakes. We *know* it costs money to put on four-wheel discs, but we sure would be glad to pay the extra bucks for the extra peace of mind. The only other American cars to offer four-wheel discs are Buick Riviera and Corvette.

12

Plymouth Gran Fury Brougham is top of the line, offers canopy vinyl roof and opera windows that were standard equipment last year. Chrysler Corp's 400 and 440 V8 lean-burn engine options continue to offer good throttle response and mileage while meeting emission specs.

13

Plymouth Trail Duster is advertised as "multi-purpose vehicle" but we all know what *that* means. You can pick up the kids after school on Friday and boogie right on up to that favorite fishin' hole in air conditioned comfort. Pretty expensive, but a good deal for a single-car family that likes to get away from it all.

Our photographer visits the Rock Riders Motorcycle Club, Hickam AFB, for its safety seminar

Members of the Rock Riders Motorcycle Club perform tune-ups and maintenance on their bikes prior to departing for the safety seminar on another island.

Sgt Al Green wrestles with his gas tank to dump his fuel before turning in his motorcycle to the air freight terminal.

At the airshipping terminal, last-minute removal of windshields and other items that might be damaged in transit was quickly accomplished.

What do you do when you get that caged or penned-up feeling? You take a trip of course, to larger and greener pastures. And that's exactly what the Rock Riders Motorcycle Club of Hickam AFB, Hawaii, did recently.

Hickam AFB is located on Oahu, the most congested island in the 50th state. The crowded conditions cause innumerable traffic problems, especially for motorcyclists. The longest distance they can ride between any two points is about 35 miles. The roads are shared with an overabundance of cars, trucks, buses, mopeds, and assorted other transportation devices. Thus Oahu presents congested, city-type driving no matter where you go on the island. In a very short time the island seems smaller and smaller, more and more frustrating to the cycling enthusiast.

The idea of organizing a traveling safety seminar to one of the larger islands in the Pacific group was discussed by the club membership and was originally viewed with a lot of skepticism. It wasn't until the club officers set about organizing a comprehensive safety program that they could present on the trip that the idea began to take shape.

A lot of sweat and about six months' labor by Sam Cannon, club president; Len Kovats, vice-president; Al Scott, secretary; and Al Green, advisor, were finally rewarded with their receiving approval to conduct a traveling safety seminar to the "big island" of Hawaii.

The seminar was set up to include classroom instruction plus practical application of what was taught. A major part of the instruction dealt with individual bike maintenance followed by riding procedures and techniques. Safety procedures were stressed, including a session on first aid.

The week before departure was devoted to overhauling; tuning up; changing tires, oil, and filters; and in general insuring that every bike was in top mechanical condition. The day prior to the club's scheduled departure from Oahu, all motorcycles were safety checked by club officials, and discrepancies had to be corrected before the individual was allowed to embark on the seminar.

All members of the club except one elected to airship their bikes. This was mainly for the convenience of being able to use their bikes until the day before departure.

Airshipping did present a few additional problems because, unlike surface transportation, all gasoline had to be removed from the bikes before the air freight terminal could accept them. This gave everyone a lesson on how to remove his gas tank since this was the only way all of the fuel could be removed. Then it was learned that all the bikes would be put together in large cargo containers without protection between them for shipment. This prompted some hurried windshield and goodie removals so the members could handcarry those items.

After the bikes had been checked and weighed came the next bad news for everyone's pocket book. It cost between $35 and $40 a person, depending on

continued

Story and photos by MSgt MIKE KEEFE

The Rock Riders board their airplane with their windshields and helmets in hand.

Sgt Bob Baxter, accompanied by other club members, checks his bike before accepting it off the barge he shipped it on.

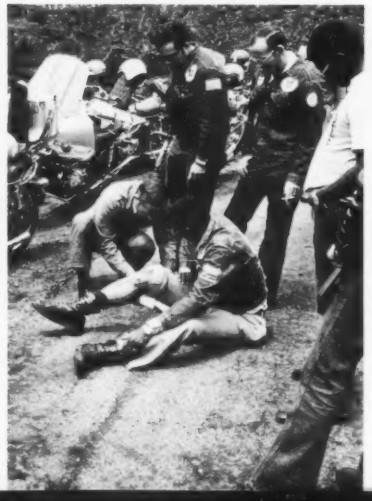
The early morning ritual of inspecting all the bikes is gone through prior to each day's riding by each of the members.

The sequencing from the hand signals to single file for passing and returning to double file after all bikes have passed is practiced during one of the clubs' group riding sessions.

The touring Rock Riders club is viewed with curiosity by some other tourists as they enter a scenic stop off point on one of their trips.

(near right)
The first aid training came in handy when Sgt Al Green fell and cut his leg on some sharp lava while sightseeing.

(far right)
On-the-road repairs were very few because of good preparation and forethought by the riders. Bringing along a few extra tools and spare parts sure pays off when you find yourself stuck in the middle of nowhere.



the actual weight of the bike, for shipment one-way. The time saved over surface transportation suddenly didn't seem so significant, and the $12 fee by sea barge plus no requirement to drain the fuel was sounding like a pretty good deal. But it was too late to change plans.

The remainder of the day was spent with final packing and preparation for the next morning's flight. The Rock Riders' early morning departure did not go entirely unnoticed at Honolulu Airport. A group such as this, all wearing their motorcycle club colors, was bound to attract attention. It's an unusual sight to see a group boarding a jetliner with windshields under their arms and toting an assortment of tool kits and helmets.

The trip to Hilo, Hawaii, was a picturesque, 30-minute flight. It was immediately evident from the air how different this island was from Oahu. Hawaii seemed immense in comparison, and the lack of any large city traffic congestion was immediately evident. From the air Hawaii appeared to be quiet farming country, with the individual farms and their crops laid out in checkerboard patterns.

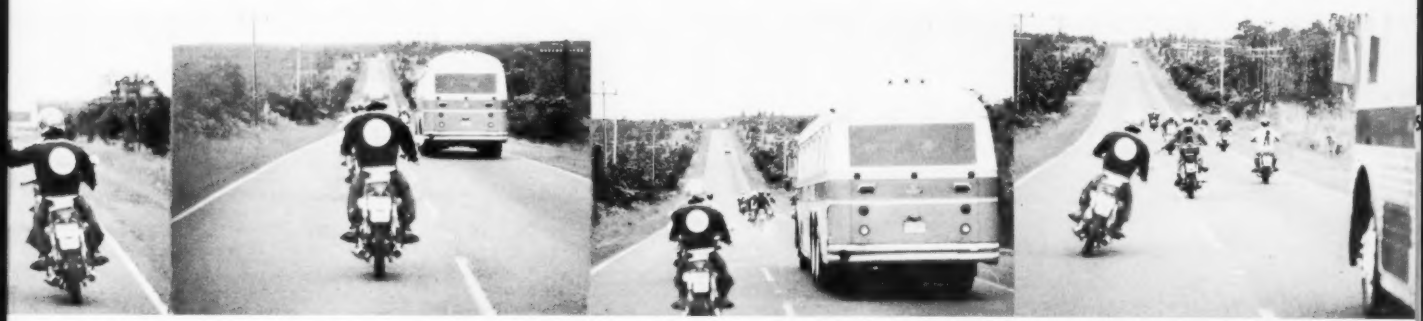
Our plane landed at Hilo Airport, approximately 35 miles from our final destination of Kilauea Military Camp where the club had reservations to stay during the seminar.

After deplaning we obtained transportation to the air freight terminal to claim the cycles. Everyone inspected his bike and assured himself that there was no damage. While windshields and goodies were being reinstalled, gasoline was sent for so everyone could get his bike to a station and gas up for the ride to camp. After settling into camp, a meeting was called to go over the plans and schedule for the week's activities.

First on the agenda was additional classroom instruction. Everyone was reminded of riding procedures and hand signals for group riding. Emphasis was placed on first aid knowledge and the safety requirement that any riding apart from the group was to be done with at least one other person. The buddy system is always good insurance.

Next day a meeting was held with about 40 members of the Big Island Motorcycle Club, and different aspects of the two clubs were discussed. Motorcycle safety films brought by the Rock Riders were shown. The rest of the week was spent touring to different points of interest around the island. On these trips almost every kind of weather was encountered from high winds to tropical rainstorms and fog. This dampened some of the scenery but it also provided all riders with a better knowledge of how to cope with adverse conditions and also to better realize the limitations of their cycles under different circumstances.

During the entire seminar there were only two mechanical breakdowns. The one injury that occurred was not attributable to motorcycling. The breakdowns involved a flat tire and a broken clutch cable, both of which were readily repaired. The injury, which was a cut knee of a rider who fell on some sharp lava rock while sightseeing, was relatively minor. At the conclusion of activities, all bikes were sent home by water transportation because everyone had decided it not only was cheaper but also less hassle.



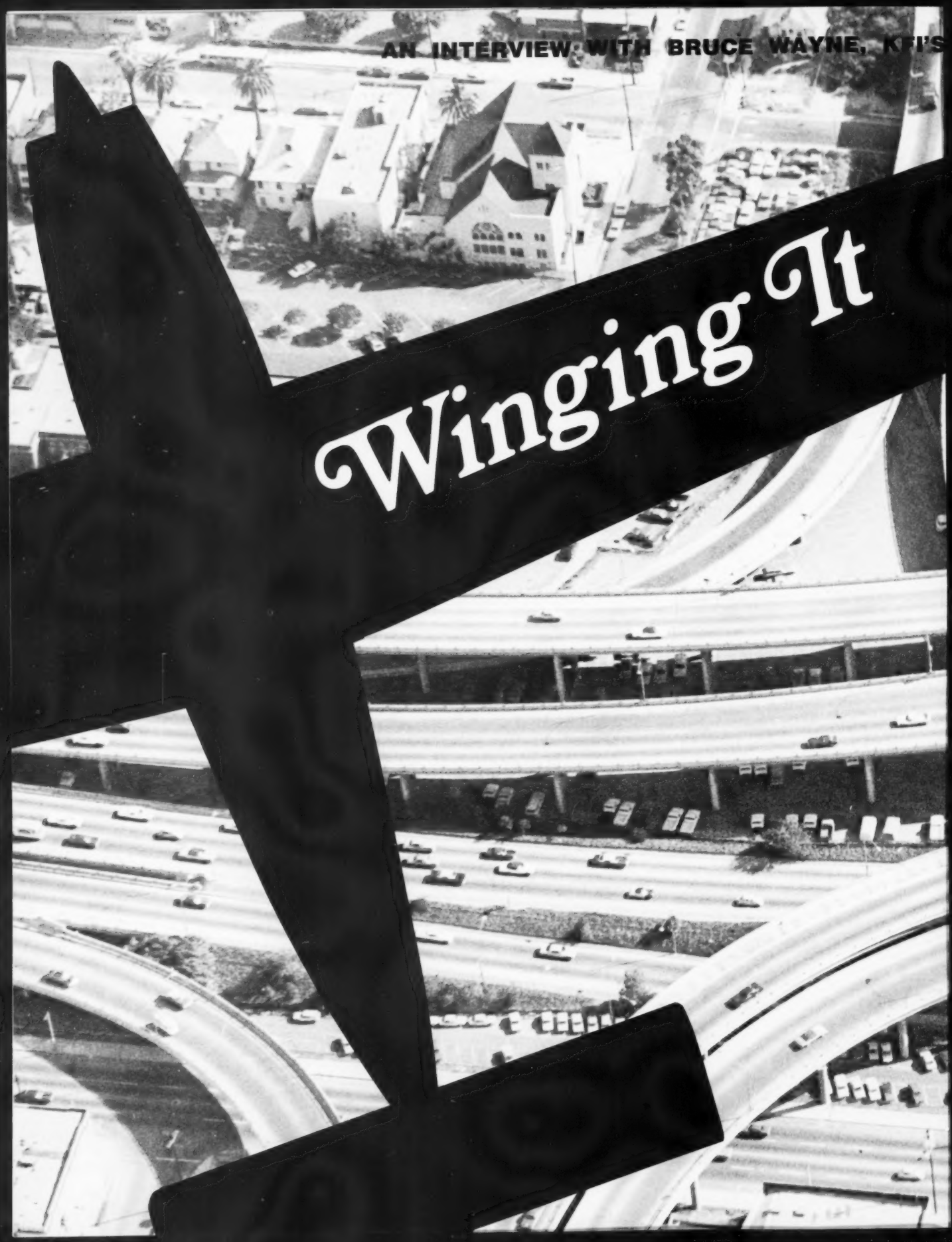
The big bonus of the traveling seminar was the experience that all riders gained in handling and maintaining their motorcycles. Three participants were new riders who had never ridden except in and around Hickam AFB. The entire seminar was termed an outstanding success by all riders for the experience they gained, the safety procedures and habits they learned, and the beautiful Hawaiian scenery enjoyed in the best possible way – on a motorcycle.

Caution was always the byword, since the group never knew when they would come upon a construction project or traffic diversion.

Extreme care had to be taken in the mountains because of the narrow roads, slow speeds and sharp blind corners that held all kinds of surprises from oncoming traffic.

AN INTERVIEW WITH BRUCE WAYNE, KFI'S

Winging It



EYE IN THE SKY

SOMEBODY UP THERE LIKES YOU!

Let's face it . . . . . you, as a driver, usually only see an average of an hour's worth of freeway traffic on a normal day. What if you were in a position to observe traffic in what is generally acknowledged as the traffic capitol of the world for five hours a day? We think that would pretty well qualify you as an experienced traffic observer.

DRIVER knows a man with just the right qualifications to help us do an article on freeway systems. His name is Bruce Wayne and he is the airborne traffic reporter for radio station KFI in Los Angeles.

Bruce, a native of Manchester, N.H., began his career as a broadcaster in the Air Force, working with the Armed Forces Radio and Television Service (AFRTS) "defending downtown New York from enemy invasion." After his discharge, Bruce went to Boston, Mass., as a combination newscaster and disc jockey with radio station WHDH. He learned to fly courtesy of his G.I. Bill benefits, and became the first flying traffic reporter in Boston.

He then moved west to beautiful downtown San Bernardino, Calif., in the same capacity, with KRNO radio, and in 1970 took his present position with KFI, one of the nation's largest radio stations. Bruce estimates that in the course of a day, over one million people hear his traffic reports.

Every weekday morning for two hours and afternoons for three hours, Bruce gives live traffic reports telling motorists of traffic conditions, accidents, tie-ups, hazards, and an occasional bad imitation of disc jockey "Sweet Dick" Whittington, his verbal nemesis at the station.

DRIVER flew with Bruce on a typical Friday afternoon flight over the highways and byways of Los Angeles and suburban Orange County. What follows is DRIVER's interview with Bruce, conducted *after* we got back on the ground.

DRIVER: Well, Bruce, thanks for the flight . . . we never knew that someone had paved the Los Angeles basin!

WAYNE: Yes, it is quite a sight. Do you realize that Los Angeles and Orange Counties have more miles of paving than some countries? Also, do you realize you just went flying with me on Friday the 13th?

continued

(left)
To Bruce Wayne, a thorough preflight is a number one choice for eliminating accidents. We don't know if Bruce is winding the rubber band or checking to see if the prop is still installed, since he admits that Cessna makes great airplanes but lousy gliders.

DRIVER: *Now* you tell us! But now that we're not boring holes in the sky, let's get down to business . . . what's the strangest thing you've ever seen happen on a freeway?

WAYNE: Well, it's a close match between the 35-foot yacht that was deposited on the Harbor Freeway by an over-enthusiastic truck driver, and the load of "falsies" that spilled all over the Hollywood Freeway . . . I gave some well-rounded reports on that one!

DRIVER: Ouch . . . no wonder they put you in a plane instead of giving you a regular show! At any rate, we know you have a lot of listeners, but how, exactly, do they benefit from listening to you?

WAYNE: KFI is one of the most powerful radio stations in the Western U.S. and our broadcasts really get out there. I received a letter of thanks from a man in Indiana who picked up my broadcasts covering the San Fernando fires a few years ago. He was able to determine that the property he owned in the fire area was out of danger. My main concern, though, is the local motorist.

My reports serve two primary purposes. First, I give the locations of, and the reasons for, accidents. Secondly, I advise the motorist where traffic is slowing. He learns from my reports where and when he'll have to slow down or be extra cautious. Often I can save motorists time by mentioning two or three routes that are less congested.

DRIVER: What do you consider to be some of the worst offenses committed by freeway drivers?

WAYNE: Number one on the list has *got* to be the driver that's drunk at eight o'clock in the morning! When you're driving in the evening, you're at least

(left)
This is why motorists need Bruce Wayne. Rush hour traffic can be flowing easily one minute, completely bottled-up the next. Bruce can spot tie-ups and advise drivers to take alternate routes. Flying with Bruce, you get the impression someone has paved the entire city of Los Angeles.

One of the prime hazards of the California freeway system is exiting the freeway from the "fast" lane. Tourists cause the most problems here. They tend to drive in the slow lanes so they can see things of interest, then find themselves having to speed up rapidly, cut across three or four lanes of traffic, then slow down quickly to exit ramp speed.

subconsciously aware that there may be drunks on the road, but you sure don't expect it in the early morning. If you combine the unknown factor of a drunk driver in the A.M. with the ever-present danger of tailgaters, and the "Oh look, Ethel" tourists, you get some idea of what freeway driving can be like here.

Another thing that I notice is that California drivers won't always slow to meet driving conditions. They think in terms of minutes instead of miles. In other words, they'll tell you Sherman Oaks is 30 minutes away, not 20 miles. Then they drive to match that time. It doesn't seem to make any difference if there's fog, or rain, or heavy traffic . . . they drive to Sherman Oaks in 30 minutes or else!

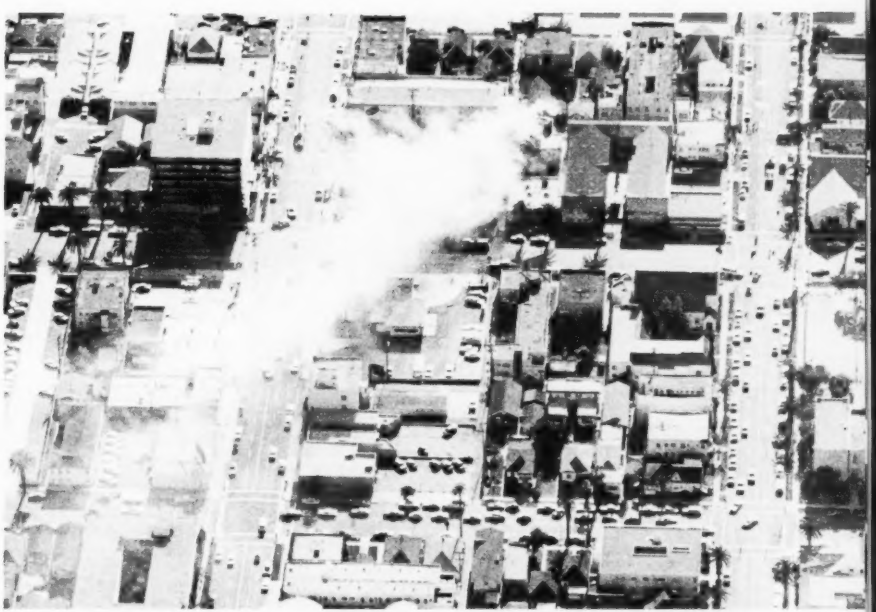
Tourists who slow, or worse, stop, at freeway on-ramps have really caused some bad accidents too.

But, coming back to the primary danger, do you have any idea how much trouble can be caused by a drunk going the wrong way on a freeway, or making a weaving, last-minute lane change? Morning drivers just can't cope with a drunk . . . many of them are trying to get themselves in shape and just aren't ready, physically *or* emotionally, for a disruption in the traffic flow.

DRIVER: Since you rate drinking drivers as the primary hazard, what do you think can be done to get them off and *keep* them off the road?

WAYNE: Well, I don't think the present system of monetary fines is working. I think you've gotta hit a person where they *live,* not in the pocketbook. I believe a short, maybe two-day, jail sentence would be most effective. As it stands, you just pay a fine and perhaps attend traffic school at night. But if you went to jail, everybody would know. "Hey,

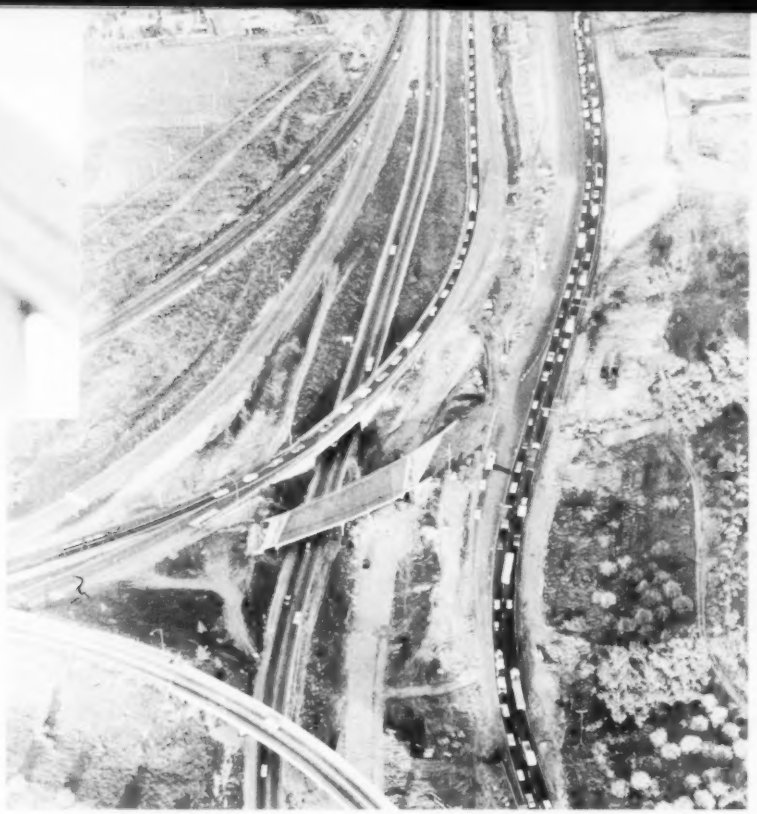
continued



This building fire stopped traffic for blocks around, but police arrived soon enough to establish traffic control. At another fire, we saw fire equipment unable to get to the scene because of the traffic jam caused by rubber-neckers. The same holds true for accident scenes. Do yourself and the police a favor . . . when you see a fire or accident, clear the road or change your direction of travel.

(right)
This freeway interchange next to Disneyland is almost always crowded. When planning a trip, or even just a crosstown jaunt, try to avoid areas of known high-density traffic.

Five hours a day, five days a week, Bruce flies over the Los Angeles area giving ground-bound motorists an overview of traffic conditions. Estimates are that over one million people hear him each day.



The State of California has an annoying habit of beginning construction on freeways and then running out of money. When you see a sign in California that says, "Freeway Ends Here," you can *believe* it!

continued

WINGING IT

did you hear so and so's in jail? For drunk driving? Wow, I didn't think he was that bad!" Your spouse, your kids, your neighbors, they'll all know. That hits a person personally, and just may make him take a look at himself. Simply paying a fine won't do it. I also favor *automatic* suspension of driving privileges for drunk driving convictions.

DRIVER: Can you think of any ways that driving could be made less "risky"?

WAYNE: Sure, eliminate cars and drivers! Seriously, I *like* my little Datsun . . . I *like* to drive. I don't think mass transportation will work in most places, so people will continue to drive. I think, in order to make driving safer, we could take a lesson from the pilots. First, a pilot has to pass a rigorous physical and a difficult written and practical test. Secondly, a pilot will preflight his craft before every operation, something the majority of drivers neglect. Third, a pilot is more familiar with the regs that govern his acts than the motorist is with the laws that affect him. And fourth, 99% of all pilots won't drink and fly. It's just not healthy. Coming into the Orange County Airport drunk is the same as negotiating the Harbor-Hollywood-Pasadena freeway interchange . . . it's just *difficult* to do when you're sober. Drunk, well . . .

DRIVER: In your opinion, Bruce, just how dangerous are the California freeways?

WAYNE: Well, with only a few exceptions, I don't feel that they are *too* dangerous. I believe that while the average driver is on a freeway, he is more alert. He's heard all along how bad freeways are, and he takes extra care. Most drivers are like that, and the result is that with most drivers being more alert and cautious, accidents are caused mostly by truck drivers taking transitions too fast, or by erratic (usually meaning "drunk") drivers. With traffic all flowing (hopefully) in the same direction, no intersections to worry about, and everyone being extra cautious, I think freeway driving can be safer than driving on surface streets. I will admit though, that when an accident *does* occur, it is usually more intense and complicated than on regular roads. Surface streets usually don't have 100 car pile-ups. Also, when a guy loses a mattress or a chair out of his camper on the street, he'll usually stop and pick it up . . . that isn't possible on a freeway. You have to be more alert for objects in the road when you drive the freeways.

DRIVER: Which would you say is more dangerous, Bruce: The San Diego Freeway or Route 128, the loop around Boston?

WAYNE: Definitely Route 128. Weather conditions make the most difference. You know, snow and ice, and a lot of rain. And the Eastern habit of funneling six lanes into two, like at the Callahan Tunnel entrance, isn't my idea of safe highway construction, nor are the traffic rotaries in New England. When I was with WHDH in Boston, I saw that most traffic accidents occur at a rotary. (Ed's note: A rotary is a circular intersection where traffic enters from several directions at once. The worst problems with a rotary are difficulty in figuring out if you or the other guy should yield, and crossing from the inside lane to the outside lane to exit the rotary.)

DRIVER: What are *your* favorite tips for drivers.

WAYNE: The best tips that I can offer are: preflight your car *every* time you drive, and use your seat belt and shoulder harness. If you have a flat tire because you didn't preflight and notice the nail, and then lose control during the blowout because you aren't belted in, I think that makes *you* morally responsible for any consequences of the accident!

The wisdom of Bruce's words was driven home over and over again that afternoon as we saw more traffic in three hours than the normal driver sees in 10. The combination of fires, accidents, bottlenecks, and drunk drivers reminded us of a movie running at double speed.

The accident rate at this six-way intersection is one reason Bruce thinks travel is more dangerous on surface streets than on freeways. Bruce explains more about his reasons in the text.

Tourists are *usually*, but not always, responsible for this phenomenon . . . traffic backed up on an entry ramp. There are several ways to enter freeway traffic flow, and in California, this ain't one of em! Also, imagine this situation in reverse. Exiting a freeway down a ramp and around a corner at too high a speed, and then finding traffic backed up, can ruin your day.

WHEEL BEARINGS

Get your **BEARINGS . . .** ✓ **checked**

This is part one of a two-part series on front end repair and inspection. In this part we'll cover wheel bearings and then we'll move on to ball joints, tie rod ends, and the other bits and pieces that make up the standard American front suspension. If you don't find your car listed here, don't despair. Just go right to your installation library and check out its tech manuals.

The library's tech manuals will also give you torque and tightening specs. You'll need these specs, since we can't mention them all here due to space limitations.

One point to remember if you check the front end and find bad components . . . if you're not going to do the repair work yourself, check around and find a *reputable* repair shop. We say this for two reasons. One is that some shops may try to take advantage of you (price-wise) because of the technical nature of the repairs. Another and more important reason is that, in our book, anything less than *first-rate* front end repairs is just plain bad news from a safety standpoint.

IF . . .

If your car wanders from side to side across the highway, or feels like it's going uphill through a bucket of glue, it's time to take a look at those front wheel bearings.

Periodic inspections and adjustments are your best safeguard against bearing failure. Normally, only the front wheel bearings are checked because only they are adjustable. The rear wheel bearings usually aren't disturbed unless there is some specific reason to suspect them. Also, once rear wheel bearings are removed they must be replaced, not reinstalled.

continued

1

Block the car to prevent rolling, and lift the front end so jackstands may be installed. Lug nuts should be loosened prior to lifting the front end.

2

Remove the dust cover with a left-and-right twisting motion. Chisels, screw-drivers, and bigger hammers are *not* the way to go. Cap is reuseable if not dented.

3

Cotter pin extractor works well in tight places. Pins can be reused, but new ones are preferable.

4

Some cars have a castellated nut cover or retainer. Reuseable if not dented or mis-shapen.

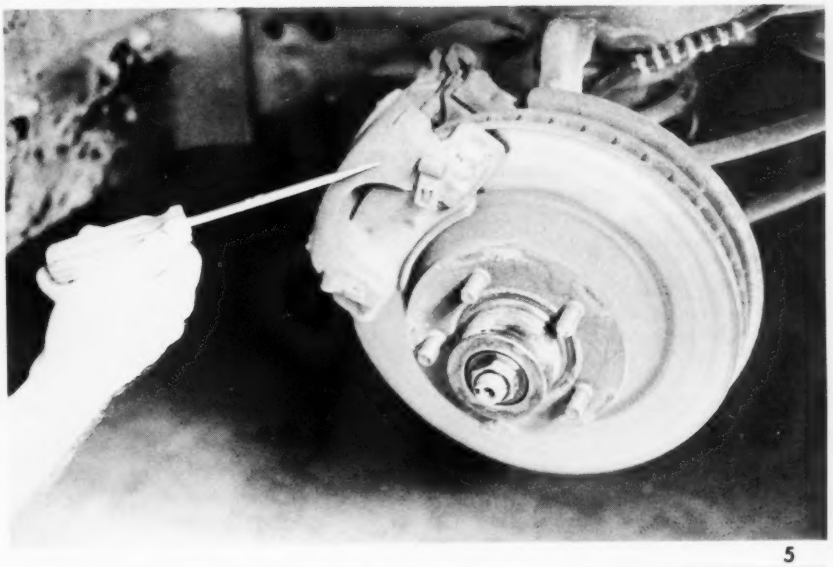
5

If your car has drum brakes, move on to picture 8. If you have discs, remove the wheel at this point. You'll see the brake rotor and caliper. Caliper must come off before rotor hub and bearings can be removed.

2

3

4



5

INSPECTION

To inspect your front wheel bearings, first block the car to prevent rolling, then jack up a front wheel and support it with a jackstand so the wheel can be removed. Take off the hubcap or wheel cover, dust cover, cotter pin, adjusting nut (be careful here, your car may have a nut with a left-hand thread), flat washer, and outer bearing. Then carefully remove the wheel, hub and inner bearings as a unit.

Lift out the small bearings at the outer end of the hub and turn the wheel over to remove the rest of the bearing assembly. First pry out the oil seal and lift out the large bearing, then remove the bearing cups.

When the bearings are removed, check the color and odor or the grease. If it looks burned or black, or has an acrid odor, that's a dead giveaway that the bearing has been running hot. If the grease looks and smells normal, clean each part of the bearing assembly in safety solvent and allow to dry. *DO NOT* dry the bearings by spinning them with a blast from the air hose. It'll force grit into the bearings, and we're sure you all know the other hazards of compressed air.

When the bearings and cups are clean and dry, check them for a series of indentations where the rollers have slammed into the surface of the cup (called *brinnelling,* caused by severe impact like hitting a deep rut), and chipping or crumbling on the small ends of the rollers (called *spalling,* caused by excessive clearances).

Fractures will appear as fine hairline cracks across the surface of the cup or cone. These are usually a result of forcing bearings onto oversize spindles, forcing cups into warped hubs, or improperly seating the cups.

Pits or pockmarks are caused by corrosion and, while similar in appearance to spalling, occur at random along the bearings or cups. Boat trailer owners should pay particular attention to this problem. For car owners it is usually an indication that moisture or road chemicals have entered the bearing through a defective seal and have contaminated the bearing grease. It's also possible for corrosion to be caused by handling a bearing when all the oil has been washed from its surface. Good ol' sweat can really corrode uncoated steel, so it's a good idea to handle clean bearings with a clean, dry cloth instead of your hot little hands.

End wear is similar to spalling, but appears only on the large ends of roller bearings. It's usually caused by too-tight bearing adjustment, resulting in insufficient clearance.

If you find any of these defects, replace the entire bearing assembly. Replacing just one part is not a good idea because the failed part has most likely affected other parts and those too will fail soon.

DON'T BE DIRTY

We didn't say "don't *get* dirty," we said "don't *be* dirty." Dirt and grit are the enemies of all mechanical assemblies, and if your work area or tools are all covered with "yecch" the new parts aren't going to last very long.

Usually, when installing new bearings no lubrication is necessary. Most new bearings are pre-lubed and should be used just as they come from the box. Old bearings that are in good condition should be repacked with special wheel-bearing grease.

Before installing the bearings, clean out the bearing cavity with safety solvent. Coat the cavity with wheel-bearing grease, then install the bearings.

REASSEMBLY

Since we know you've already checked the new bearings and races against the old ones to insure they are the same, install the races and large bearing. Then lightly wipe the new seal with clean oil and start it into the hub by hand (making sure the lip is correctly positioned). The oil will make the seal slide on the spindle easily and help to prevent damage. Never installl a seal with just a hammer, and don't use a steel punch which could damage the casing and cause leaks. *Never* reinstall a used seal. Mount the wheel carefully to avoid tearing the seal on the spindle, and then install the outer bearing, washer, and adjusting (castellated) nut.

BEARING ADJUSTMENTS

In all of the following forms of adjustment, the amount of tension applied to the thrust washer is decided by the pressure on the adjusting nut. This pressure is specified by the manufacturer and shouldn't be altered. You *can* adjust for free play and free wheel rotation but, although it may be reasonably accurate, it shouldn't take the place of a torque wrench adjustment.

Cars using tapered roller bearings should be set with a torque wrench *only,* if the manufacturer specifies a torque setting to seat the bearings. Tapered roller bearings are easily damaged by improper torque values.

To adjust a bearing by feel, first seat the bearing assembly by tightening the nut with a long wrench until you feel a definite resistance while rotating the wheel. Loosen the nut and run it up again finger-tight. Continue rotating the wheel and tightening the nut, and check for free play. Stop tightening when free play is gone. Be careful not to misinterpret ball joint looseness for free play.

continued

6

On this Merc, caliper removal was accomplished by removing only two bolts. Caliper then slides up away from rotor.

7

DON'T let caliper hang by brake line. Use a piece of stiff wire to form a hook, and hang the caliper from the A-frame or tie rod.

8

Remove bearing retaining nut. (Wheel will still be on hub for you drum brake guys.)

9-10

Being careful not to touch rotor faces, wiggle rotor (or wheel) back and forth. Outer bearing and flat washer will pop out slightly. You can either remove bearing now or remove entire assembly. First method will keep outer bearing from falling in the dirt; second will prevent distortion of inner race and seal face.

11

Remove and discard seal.

12

Inner race can now be removed.

6

7

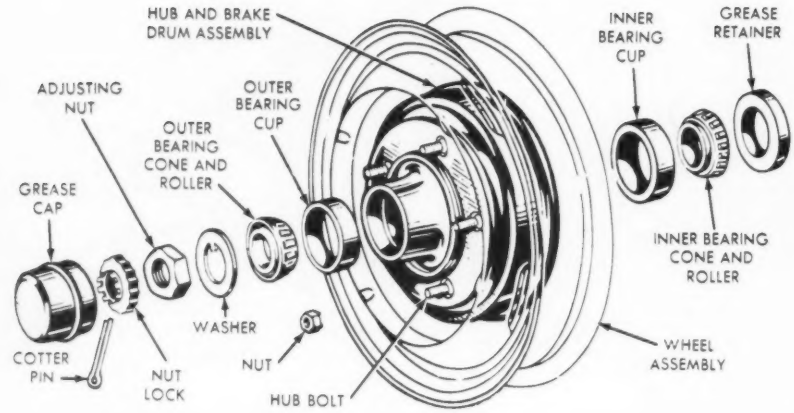
8

9

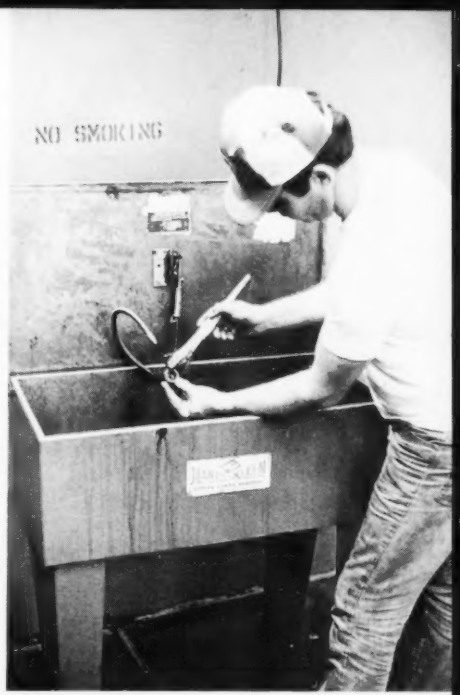
10

11

12



Typical drum brake wheel assembly showing bearings. Note: Disc brake assemblies differ only slightly from the one shown.



13

continued

THE BACKYARD MECHANIC

Spin the wheel again and stop at several points to check for free play. If necessary, tighten the nut to eliminate the free play, but never back off more than one slot on the nut to get to the point where the play is eliminated. If the bearing becomes too tight, back the nut almost all the way off and start over . . . you probably haven't seated the bearings correctly yet.

The exact procedure for torque wrench adjustment varies from car to car as well as model to model, so be sure to have the correct torque specs available before you start. Mitchell Manuals, Chilton's, and Motor Manuals all have such info in them.

Here are some ballpark figures for '72 and earlier popular cars:

Chevrolet—Spin the wheel in a forward direction. Tighten the spindle nut to fully seat the bearing and then back off the spindle nut until it's just loose. Snug the spindle nut finger-tight but don't install the cotter pin even if the holes line up. Instead, loosen the nut until the *next* hole aligns. Under no circumstances should the nut be even finger-tight. When the bearing is correctly adjusted there should be .001- to .008-inch end play.

FoMoCo—Spin the wheel in a forward direction and tighten adjusting nut to 17-25 ft/lbs. Back adjusting nut off one-half turn. Tighten adjusting nut to one (1) ft/lb. Install the nut lock and a new cotter pin.

Chrysler—Tighten the adjusting nut to seven (7) ft/lbs while rotating the wheel in a forward direction. Position the nut lock so that a pair of slots line up with the cotter pin hole. Back off the nut lock (with the nut inside it) one slot, then install a new cotter pin.

Remember, not all manufacturers specify a torque setting, and in some cases the nut is never to be torqued. Consult your tech manual.

SPECIAL CASES

Cars with disc brakes present a special problem with respect to wheel bearings . . . the caliper and disc must come off for bearing service.

This means you'll remove the wheel first by unbolting it from the wheel hub.

On older cars with fixed caliper disc brakes, removing the caliper may be a chore. If possible, hang the caliper from the front suspension with a piece of wire so you don't have to disconnect the brake line.

Under *no* circumstances should you let the caliper dangle by the brake line. This is a "sureinhell" way to cause brake line damage and possible premature hose failure.

If you find a surprise, in the form of shims under the bolt heads that attach the caliper, be sure to refit them exactly as you found them since they center the caliper over the disc.

Once the caliper is off, pull the dust cap from the disc and proceed as with drum-braked cars.

DRIVER wishes to thank Fred Cable, Cable's Mobil, and Warren Reeves, Zulch Auto Works, both of San Bernardino, Calif., for their assistance in preparing this article.

13

All races are cleaned in safety solvent and individual rollers checked for spalling, brinnelling, etc. (See text for further info.)

14

Clean and inspect spindle. This one shows brown ring. You can figure the outer bearing didn't have enough lube.

15

Use only first-quality wheel bearing grease. Lithium-based compounds are usually more waterproof than straight petroleum base.

16-17

If you don't have a bearing repacker, take a handful of lube and work it in from the big end of the bearing. Then put a glob in the palm of your hand and force the bearing into the center. Use your palm as a kind of "hydraulic" pump to insure thorough grease penetration. Reinstall inner race and seal.

18

Regrease spindle and reinstall hub. Caliper, outer race and flat washer go on next.

19

Tighten or torque bearings to correct settings. Wheel is usually installed for tightness setting. Merc uses initial setting of 17-25 ft/lbs, loosen, retorque to one (1) ft/lb.

20

Reinstall nut lock or cover if equipped, and install cotter pin. Clip pin if too long, and bend one tang to form lock.

14

15

16

17

18

19

20

BACKFIRE

LETTERS TO THE EDITOR

Address your letters to:
Editor
DRIVER Magazine
AFISC/SEDD
Norton AFB CA 92409

MOTORCYCLE VERSUS AUTO ACCIDENTS

In the past few months I have noticed the different opinions expressed about motorcycle safety. I have but one thing to say, "If you have never tried it, don't knock it." I personally would rather be on a motorcycle any time than in a car. Sure, you can get seriously hurt in a head-on collision with a car, but that is not the only kind of accident.

If you are driving down a road with a cliff on one side and your car suddenly veers off the road, you're going to have a natural reaction to panic. You won't reach over to open the door and jump away from the car before it explodes. On a motorcycle the first natural reaction would be to cover your face, requiring you to let go of the machine and fall off before it explodes.

If driving further down the same road and the car were to veer off into a lake, you'd have a car full of water and a wet or possibly dead motorist. You would not have thought about unlocking the door before hitting the water and would be unable to unlock it in the water. Some people may freeze on a bike, but the natural reaction would be to let go of it and cover the face.

I had an accident while motorcycling in the woods and, thinking back, I would have been a lot worse off if I had been in a car.

PFC John P. Dyer, USA
HQ Co, USAG Box 50
Fort Drum, NY 13601

NEON TIMING LIGHTS

In your issue of "Backyard Mechanic" Vol I Part X you mention marking timing marks with white or fluorescent paint. This may be fine on some vehicles when using a neon timing light, but on Fords, particularly the ¾-ton pickups, you may be in for the surprise of your life. I have a '73 Ranger Camper Special with the 390 engine, power steering, airconditioning, and the heavy-duty cooling package. It is very hard to see the timing marks plus the distributor is mounted on the front of the engine, and the added height of the vehicle makes it necessary to stand on a stool or stand of some sort and hold the neon timing light in position with the left hand under the alternator very close to the drive belts. At the same time you reach over the turning fan blades which are slightly exposed behind the cooling shroud with the right hand to position the distributor. This is where you get into trouble. I was lucky and had only a torn shirt sleeve to prove it. I could have gotten a badly mangled arm.

I might add that most of the neon lights aren't that well insulated and due to the weak light given off, most people tend to get too close to pulleys and belts, creating a hazard of getting into the position to lose a finger or a hand if a shock occurs. To me it was worth a few extra dollars for a good timing light.

You have a fine magazine. Keep up the good work.

ADJ1 Norman R. Beachel, USN
AIRANTISUBRON THIRTY-THREE
FPO San Francisco 96601

Right you are about the timing light problem, and not only on Ford trucks . . . have you peeked under the hood of the '76 Chrysler products? A fella could really get himself in a jam trying to time one of those critters with a neon timing light.

"TIRE ROUND-UP" CAPTION GOOF

I am writing concerning your article entitled: "Tire Round-up" (Jul '76). I enjoyed your article and I thought it was very informative. However, I have found one of the illustrations, on page 21, is incorrect. I am speaking of "The difference in construction" between bias ply and radial ply tires. In the illustration instead of a bias-radial tire construction comparison, there is a comparison between a four-ply bias tire and a 2+2 steel belted bias tire.

Bias defined: In a slanted manner.

Radial defined: A pneumatic tire in which the ply cords that extend to the beads are laid at approximately 90 degrees to the center line of the tread.

Before entering the Armed Forces my occupation was "Tirebuilder" at Dayton Tire & Rubber Company, Oklahoma City, Okla. I have constructed both bias and radial tires. The main quality of the radial tire is the fact that the ply cords are laid at an 88 degree angle to the center line of the tread.

PFC Mark W. Vanderburg, USA
Fitzsimmons Army Medical Center
Denver, CO 80240

You are so right, Mark! Somewhere between the art layout and proofreading the captions got a bit astray and we just plain missed the mistake.

HELMET LAWS

In reference to Jackson E. Rollins' letter (May '76 DRIVER) concerning helmet laws, I agree completely. I personally wear a helmet or use seat belts because I believe in them. But since America is a free country, a person should be able to choose if they want to wear a helmet or use seat belts in their own mode of transportation. I would like to see that *all* Americans have that freedom that we all love so much—the freedom to choose. Any other way would be a dictatorship.

MSgt George Washington, USAF
7350th ABGp/USAFE
APO New York 09611

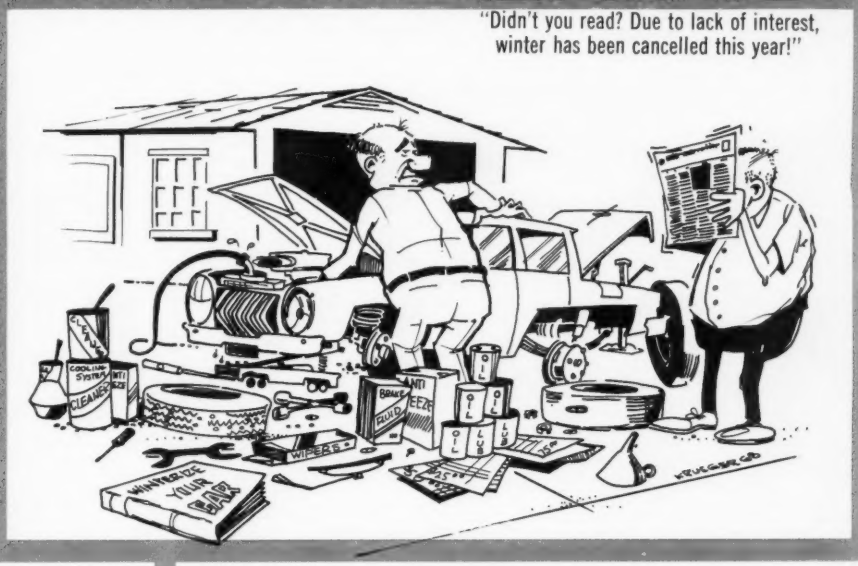
Mr. Jackson E. Rollins: When I ride my motorcycle, my objective is to enjoy it without getting involved in an accident. How long have you been riding? Isn't this the way all bikers feel?

You say if you knew you were going to have an accident you would stay off. Well, so would I. Have you ever raced and had your partner go down in front of you, or have a car pull out and pass nearly hitting you and forcing you to lay down? Come to life, Pal, don't dream. Accidents can happen to anyone, so admit it. I'm not necessarily for helmet laws either. After all, there aren't too many seat belt laws. I like to ride without one on base and quick trips to town, not to mention those sunny days riding the coast, but a helmet saved my life once already.

Gregory O. Snyder, USAF
PSC Box 1257
Loring AFB, ME 04751

Regardless of state laws, remember motorcyclists must wear the helmet on base.

☆U.S. GOVERNMENT PRINTING OFFICE: 1976—683-613/14



"Didn't you read? Due to lack of interest, winter has been cancelled this year!"

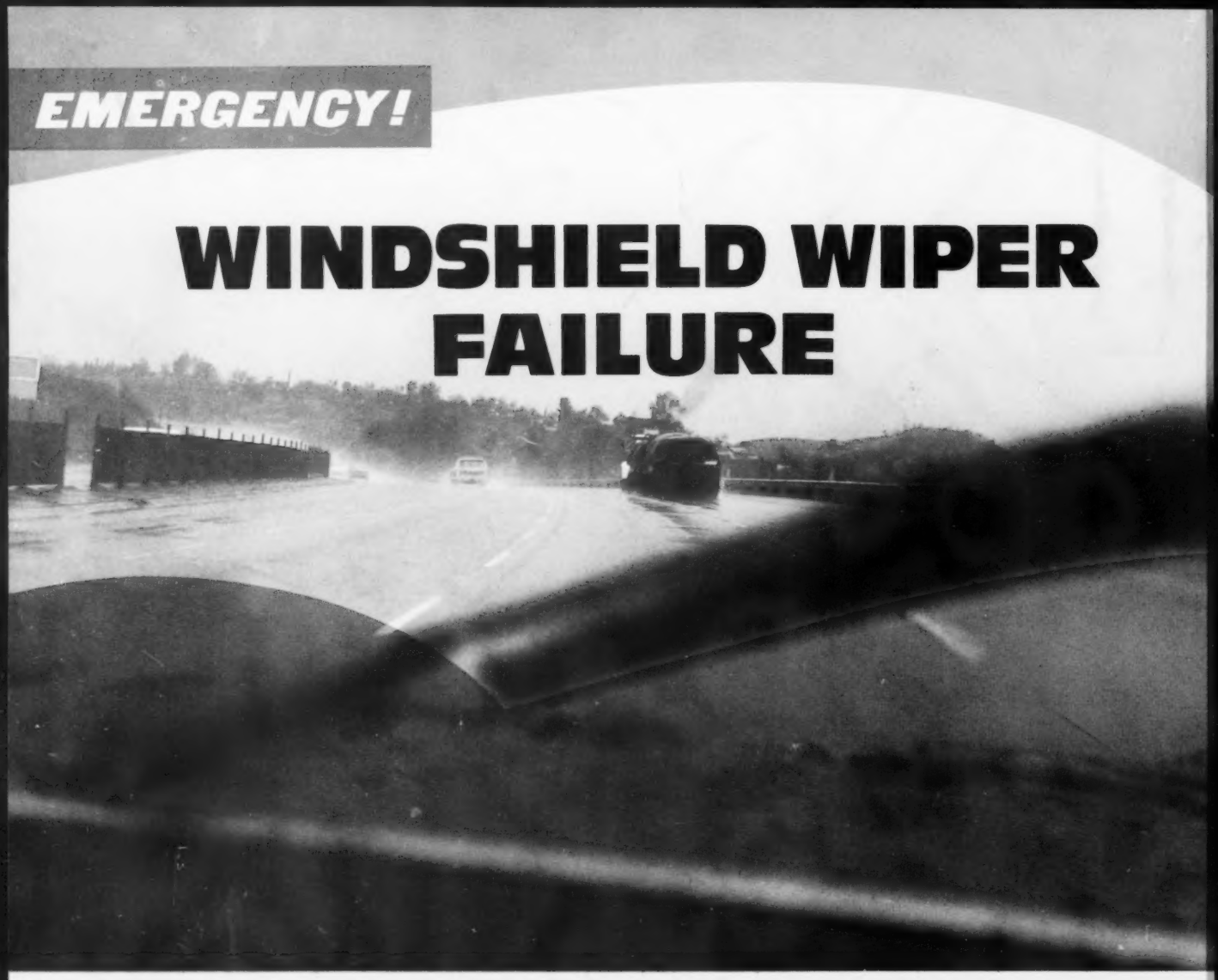
"No helmet, no roll bar, no seat belts— you ought to call it a 'doom' buggy!"

"Brother-in-law or not, next year we get a trailer hitch!"

"Look at it this way junior . . . this self-move not only saves money, it's a Happening."

EMERGENCY!

WINDSHIELD WIPER FAILURE



Windshield wipers fail when you need them most—when it's raining or snowing. Check the blades periodically to make sure they're in good shape and adjusted to conform to your windshield.

If you have the disappearing-type wipers, check the opening to the front of the windshield. Remove leaves, twigs, snow or ice from the wiper recesses and from around the wiper motor shaft and wiper arms. Foreign objects place a strain on the wiper motor and can lead to failure.

If you are on the road and you lose a wiper, or the motor ceases to turn the wipers, or a blade flies off, get off the highway immediately. Get well out of the traffic lane. Open the window and stick your head out if necessary to find a safe stopping place. See if an obstruction is interfering with wiper movement. Sometimes it's possible to push the wiper arm on the spindle more firmly.

If you can't fix the wipers yourself, wait until the rain or snowstorm has let up before proceeding. Do not attempt to drive in rain or snow without the windshield wipers.